

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty) (PCT Article 36 and Rule 70)

6.1.121

Applicant's or agent's file reference S-10	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/JP2005/002190	International filing date (day/month/year) 08.02.2005	Priority date (day/month/year) 09.02.2004	
International Patent Classification (IPC) or national classification and IPC Int.Cl. F17C1/02			
Applicant SHOWA DENKO K.K.			

1.	This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2.	This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.
3.	This report is also accompanied by ANNEXES, comprising: <div style="margin-left: 20px;">                     a. <input type="checkbox"/> a total of _____ sheets, as follows:                     <div style="margin-left: 20px;"> <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).                               <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.                         </div> </div> <div style="margin-left: 20px;">                     b. <input type="checkbox"/> a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).                 </div>

4.	This report contains indications relating to the following items: <div style="margin-left: 20px;"> <input checked="" type="checkbox"/> Box No. I Basis of the report  <input type="checkbox"/> Box No. II Priority  <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  <input type="checkbox"/> Box No. IV Lack of unity of invention  <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement  <input type="checkbox"/> Box No. VI Certain documents cited  <input checked="" type="checkbox"/> Box No. VII Certain defects in the international application  <input type="checkbox"/> Box No. VIII Certain observations on the international application                 </div>
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Date of submission of the demand 16.06.2005	Date of completion of this report 20.12.2005	
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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2005/002190

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b))
  - ☐ publication of the international application (Rule 12.4(a))
  - ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- ☒ the international application as originally filed/furnished
- ☐ the description:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the claims:
- Nos. \_\_\_\_\_ as originally filed/furnished
- Nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- Nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- Nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the drawings:
- sheets/figs \_\_\_\_\_ as originally filed/furnished
- sheets/figs\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets/figs\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

International application No.

PCT/JP2005/002190

**Box No. V** Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	1-26	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-26	NO
Industrial applicability (IA)	Claims	1-26	YES
	Claims		NO

## 2. Citations and explanations(Rule 70.7)

Cited documents in the international search report:

D1. JP 09-042595 A (TOYODA GOSEI CO. LTD.) 1997.02.14, column 14, column 15, Fig 2, Figs 4-6 Family none

D2. JP 07-243588 A (HINO MOTORS LTD.) 1995.09.19, claim 1, Fig 1 Family none

D3. JP 10-160097 A (BOEING NORTH AMERICAN INC.) 1998.06.16, claim 2, Figs 1-2 & US 5697511 A & EP 833097 A2 & CN 1184905 A

The subject matters of claims 1, 4-8 and 12 do not involve an inventive step over D1 and D2 for the following reasons.

Although D1 does not disclose the technical feature of the head plates being jointed to the reinforcing member, both the invention of D1 and the invention of D2 are concerned with a pressure vessel liner comprising a tubular tank and head plates.

Therefore, the skilled person in the art would easily conceive the idea of employing the feature of the head plates being jointed to the reinforcing member in D2 to substitute the feature of joint between a tubular trunk and head plates disclosed in D1.

D1 also discloses the feature of the form of outwardly bulging dome and a flat inner surface.

The subject matter of claim 2 does not involve an inventive step over D1 and D2 for the following reasons.

In addition to the explanation of claim 1, the skilled person in the art would therefore regard it as a design procedure to include the feature that the combined length of joints between each of the head plates and the reinforcing member is at least 60% of combined length of portions of the reinforcing member in contact with an inner surface of the head plate.

**Box No. VII** Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

The relative term "friction agitation", used in claims 3, 9, 11 and 14 has no well-recognized meaning, thereby rendering the definition of the subject-matter of said claim 3, 9, 11 and 14 unclear. (cf. "friction stir welding")

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

Continuation of: V

The subject matters of claims 3, 9, 11 and 14 do not involve an inventive step over D1, D2 and D3 for the following reasons.

In addition to the explanation of claim 1, although D1 does not disclose the technical feature of using friction agitation, both the invention of D1 and the invention of D3 are concerned with a pressure vessel liner comprising a tubular tank and head plates, and D3 discloses using friction agitation for making vessels.

Therefore, the skilled person in the art would easily conceive the idea of employing the feature of using friction agitation in D3 to substitute the feature of the joint between a tubular trunk and head plates disclosed in D1.

The subject matters of claims 10, 13, 15, 16 and 17 do not involve an inventive step over D1 and D2 for the following reasons.

In addition to the explanation of claim 1, the technical idea of using forging for making a pressure vessel plate is commonly used art.

And, D1 also discloses the feature of a bore of the plate.

The subject matters of claims 18 and 19 do not involve an inventive step over D1, D2 and D3 for the following reasons.

Cf. the explanations of claims 3 and 15

The subject matter of claim 20 does not involve an inventive step over D1 and D2 for the following reasons.

In addition to the explanations of claims 1-7, the technical idea of using a fiber reinforced resin layer for making a pressure vessel plate is commonly used art.

The subject matters of claims 21-26 do not involve an inventive step over D1, D2 and D3 for the following reasons.

In addition to the explanations of claims 1-20, the skilled person in the art would easily conceive the idea of using the pressure vessel according to claim 20 for general uses.